
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: December 2012

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per the State Water Resources Control Board (SWRCB) Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

COMPLIANCE STATIONS:		
Station Identification	Station Name	General Location
C-2*	Collinsville	Western Delta
S-64	National Steel	Eastern Suisun Marsh
S-49	Beldon's Landing	North-Central Suisun Marsh
S-42	Volanti	North-Western Suisun Marsh
S-21	Sunrise	North-Western Suisun Marsh

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh:

MONITORING STATIONS:		
Station Identification	Station Name	General Location
S-97	Ibis	Western Suisun Marsh
S-35	Morrow Island	South-Western Suisun Marsh

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

2. MONITORING RESULTS

2.1 Channel Water Salinity Compliance

During the month of December, salinity conditions at all five compliance stations were in compliance with channel water salinity standards (Table 1). Compliance with standards for the month was determined for each compliance station by comparing the progressive daily mean (PDM) of high tide SC with respective standards. The standard for December was 15.5 mS/cm. The progressive daily mean is the monthly average of both daily high tide SC values. The mathematical equation is shown below:

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days in the month}}$$

2.2 Delta Outflow

Outflow for December 2012 ranged between 13,865 cfs and 106,260 cfs (Figure 3). For the month, outflow began at 19,000 cfs and increased to 64,900 cfs in response to an early December storm. A second peak in outflow, 106,260 cfs, occurred in response to a larger storm between December 21st and December 25th. The month ended with outflow at 57,700 cfs. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for December 2012 is listed below:

Month	Mean NDOI (cubic feet per second)
December	47,350

2.3 Precipitation

Precipitation for the month totaled 7.73 inches. Two major events occurred with the first starting on December 1st and the second starting on December 21st. The majority of the precipitation, 4.34 inches, occurring between December 21st and December 25th. This data was recorded at the Fairfield Water Treatment Plant. The monthly total precipitation is below:

Month	Total Precipitation (inches)
December	7.73

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during December 2012 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
December 1-31	3 Open	In	Partially Closed

Given the wet conditions for December, operation of the radial gates was not needed. Salinity will be monitored and if levels should increase, operation of the radial gates may be needed.

Boat lock gates are partially closed due to ongoing investigation on safety concerns expressed by DFD staff. NOAA was briefed about the safety concern and will schedule a field visit to assess options with DWR to balance fish needs and safety needs.

3. DISCUSSION

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- Delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions During the Reporting Period

For December 2012, PDM salinity levels at Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ended the month between 0.82 mS/cm and 4.90 mS/cm as shown in Figure 1. Salinity levels for December started in the range of 7.11 mS/cm to 11.06 mS/cm then decreased in the early part of December in response to increased outflow. Salinity levels gradually decreased through the rest of the month. The Collinsville salinity readings for December 26th to December 31st fell below a reliable range and therefore the PDM was not calculated.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. Both stations follow the same trend as the compliance stations.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high tide SC at the compliance and monitoring stations for December 2012 were compared with means for those months during the previous nine years (Figure 4).

December's mean salinity pattern for all compliance and monitoring stations ranked the lowest in salinity levels for the past 10 years. The pattern followed that of 2004, 2005, 2008, and 2011 but at a significantly lower salinity level. As expected, the salinity levels gradually increased from east to west.

**Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations
December 2012**

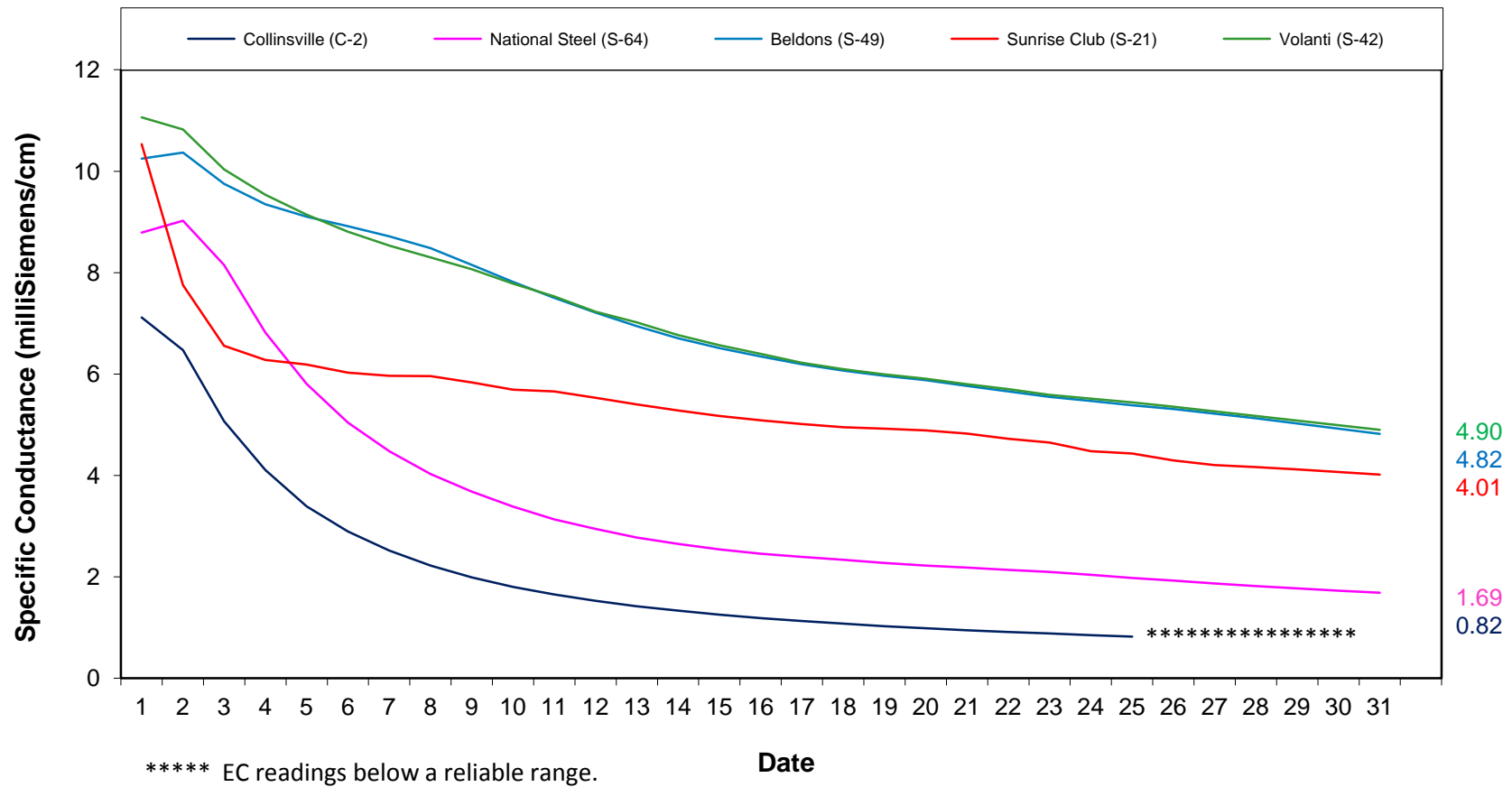
Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	0.82	15.5	Yes
S-64	1.69	15.5	Yes
S-49	4.82	15.5	Yes
S-42	4.90	15.5	Yes
S-21	4.01	15.5	Yes

*milliSiemens per centimeter

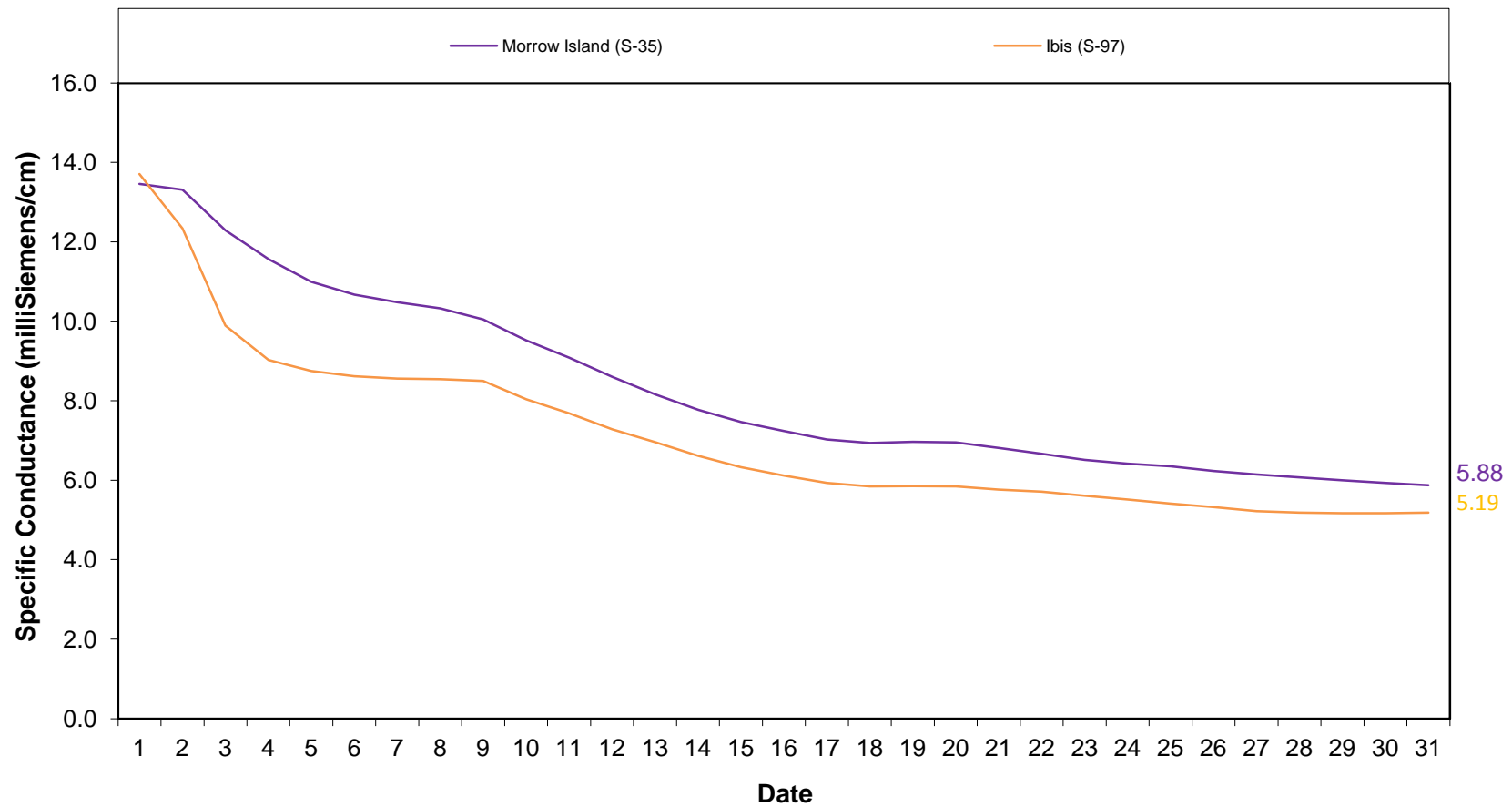
**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Compliance Stations December 2012

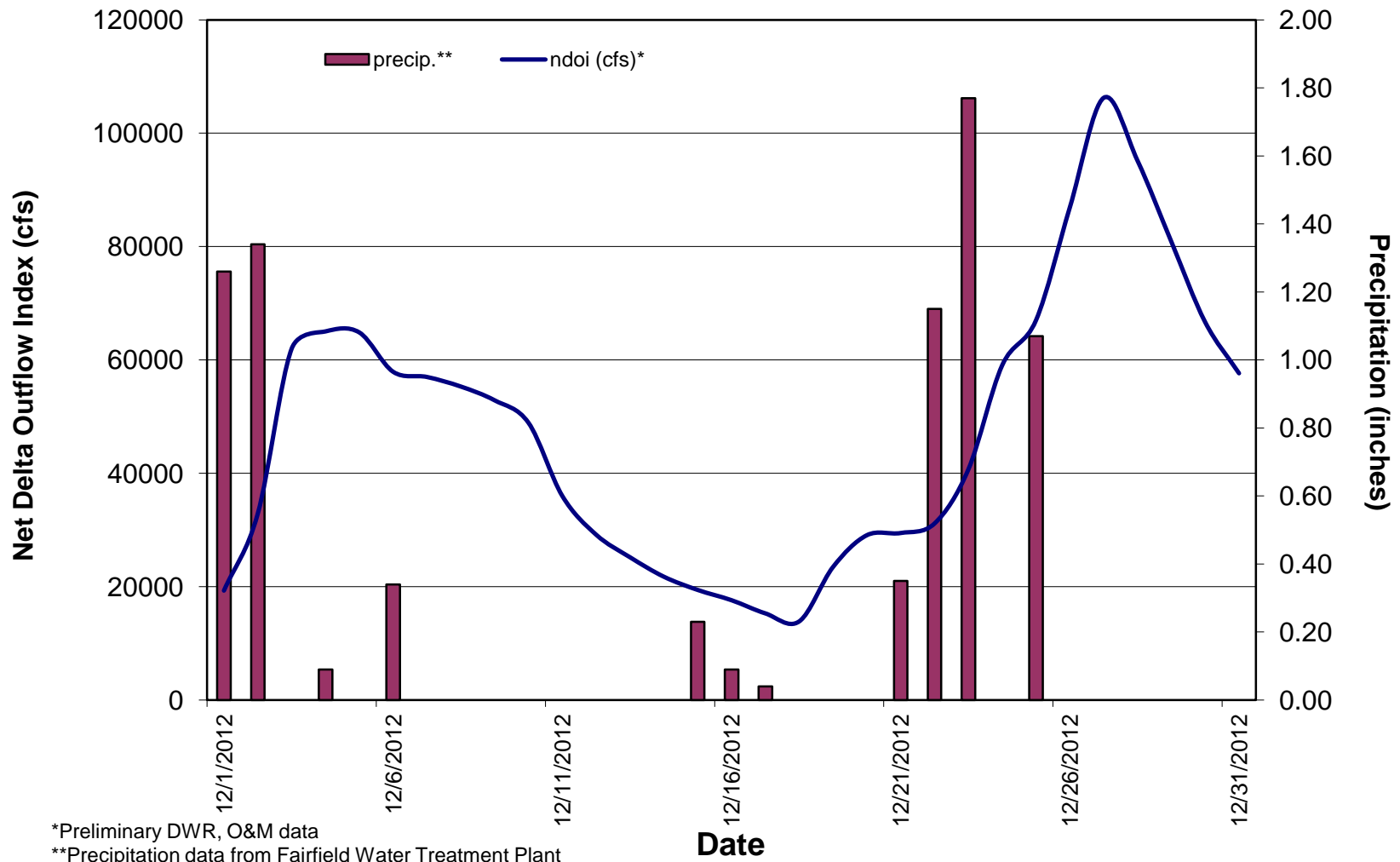
Standard = 15.5 mS/cm



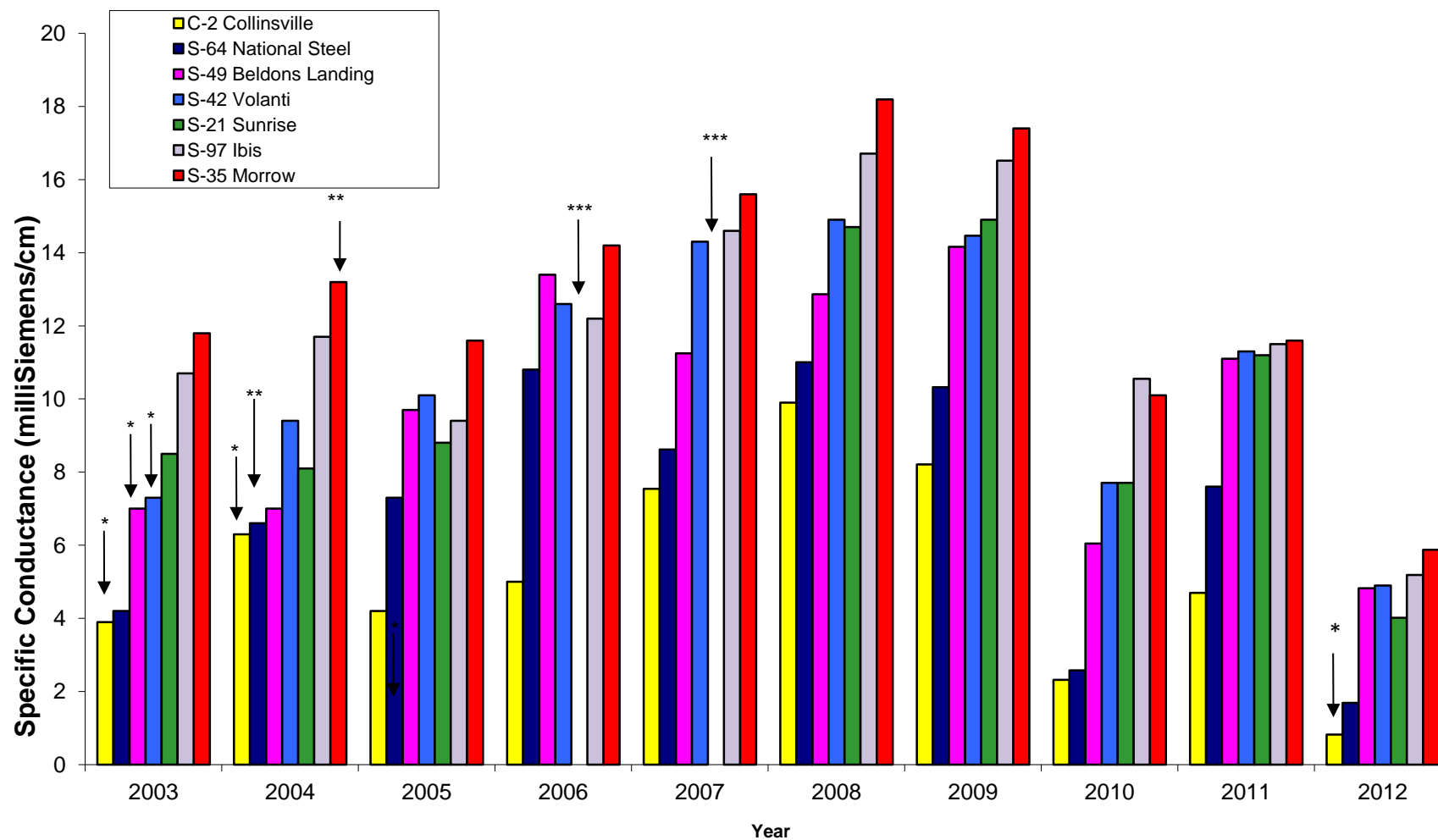
**Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance
for Monitoring Stations
December 2012**



**Figure 3: Daily Net Delta Outflow Index and Precipitation
December 2012**



**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
December 2003-2012**



* Data reflects a partial month. Data collection was interrupted before the end of the month due to equipment failure.

** Data was not obtained due to power problems at the station.

*** Data was not obtained due to equipment failure.

